## DEPARTMENT OF THE ARMY Office of the Chief of Engineers Washington, D.C. 20314

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Engineer Manual No. 1110-2-1611

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## Engineering and Design LAYOUT AND DESIGN OF SHALLOWDRAFT WATERWAYS

- 1. <u>Purpose</u>. The purpose of this manual is to provide guidance for planning, layout and design of shallow-draft waterways.
- 2. Applicability. This manual applies to all field operating activities having responsibility for the design of civil works projects.
- 3. General. Development of waterways for navigation involves channel excavation, rectification, bank stabilization, training structures, modification and/or construction of bridges, and in some cases, the construction of locks and dams. This manual covers some of the principal factors that should be considered in the design and solutions that have been successful in avoiding or eliminating undesirable conditions. Unless these factors are applied, adverse conditions or delays could occur to such an extent that traffic potential of the waterway would not be fully developed. It is important that conditions resulting from these works be satisfactory and adequate for the traffic anticipated and provide a high degree of reliability.

FOR THE CHIEF OF ENGINEERS:

Colonel, Corps of Engineers

Executive Director, Engineer Staff